



Directly Determined Linear Radii and Effective Temperatures of Exoplanet Host Stars

Kaspar von Braun (MSC/Caltech) &
Gerard T. van Belle (ESO)



JPL



Objective / Motivation / Summary

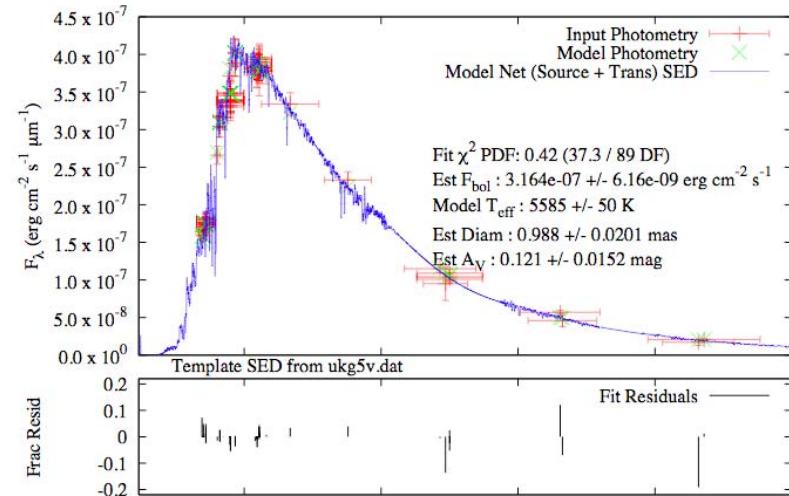


- Formation, evolution, environment of exoplanets dominated by properties of parent star.
- PTI K -band data for nine exoplanet host stars to get directly measured stellar radii (Hipparcos distances).
- Literature photometry for determination of F_{bol} .
- Combination of F_{bol} and angular diameter gives T_{eff} .
- Comparison with literature values shows general agreement with some exceptions.
- Same data for control group of ~20 dwarfs indicates no systematic differences between exoplanet hosting stars and non-exoplanet hosting stars.

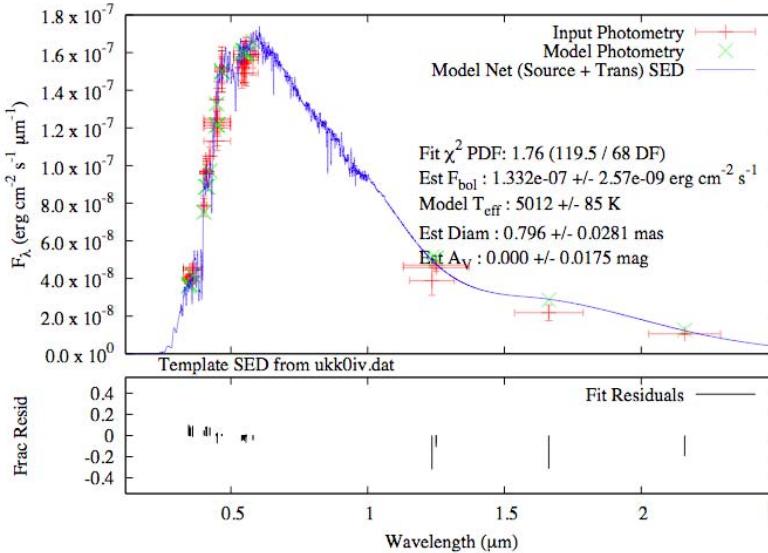
SED Fitting

- Based on literature photometry, Pickles (1998) spectral templates.

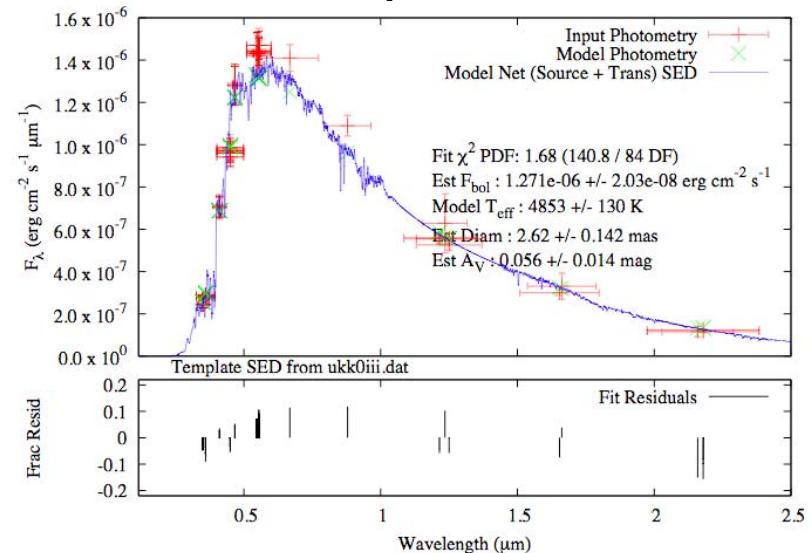
70 Vir



55 Cnc



Eps Tau



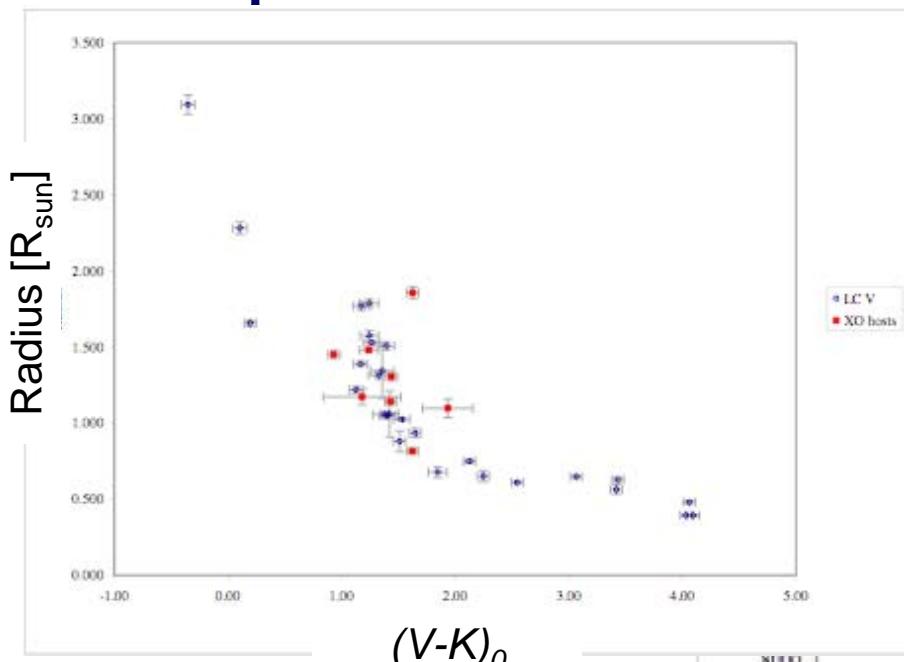
Radii and T_{eff} / Literature Comparison



HD	Name	R[Rsun]	error	R[Rsun]	error	reference	diff[sigma]
3651 A -		0.818	0.098	0.87		Pasinetti Fracassini+ 2001	0.5
9826 Ups And		1.480	0.087	1.7	0.06	Fuhrmann+ 1998	2.1
28305 Eps Tau		12.692	0.545	13.7	0.06	Mozurkewich+ 2003	1.8
75732 55 Cnc		1.100	0.096	1.04	0.06	Lang 1980 (equations)	0.5
95128 47 Uma		1.172	0.111	1.24	0.04	Fuhrmann+ 1998	0.6
117176 70 Vir		1.858	0.124	1.87		Lang 1980 (equations)	0.1
120136 Tau Boo		1.450	0.112	0.9		Pasinetti Fracassini+ 2001	4.9
143761 Rho CrB		1.306	0.149	1.36	0.05	Fuhrmann+ 1998	0.3
217014 51 Peg		1.141	0.133	1.17	0.04	Fuhrmann+ 1998	0.2

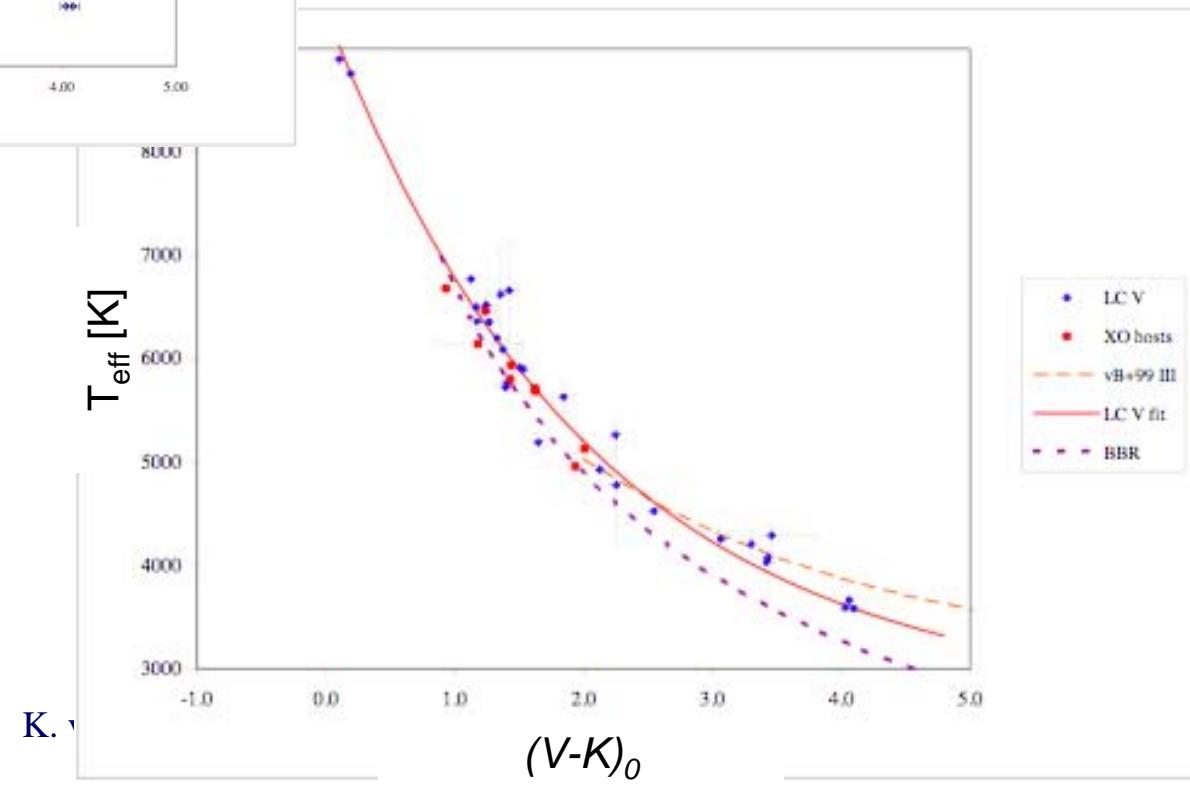
HD	Name	Teff[K]	error	Teff[K]	error	reference	diff[sigma]
3651 A -		5457	325	5221	44	Valenti & Fischer 2005	0.7
9826 Ups And		6465	188	6213	44	Valenti & Fischer 2005	1.3
28305 Eps Tau		4990	50	4901	20	Sato+ 2007	1.7
75732 55 Cnc		4952	216	5235	44	Valenti & Fischer 2005	1.3
95128 47 Uma		6140	294	5882	44	Valenti & Fischer 2005	0.9
117176 70 Vir		5687	188	5545	44	Valenti & Fischer 2005	0.7
120136 Tau Boo		6680	260	6387	44	Valenti & Fischer 2005	1.1
143761 Rho CrB		5936	339	6387	44	Valenti & Fischer 2005	1.3
217014 51 Peg		5800	338	5787	44	Valenti & Fischer 2005	0.0

Comparison with “Control Group”



Exoplanet host stars
Control group

Control group: ~20 main-sequence stars not currently known to host exoplanets, with diameters thought to be PTI-resolvable based on $(V-K)_0$ size estimator of van Belle et al. (1999)



Summary



- Used PTI to interferometrically measure radii and associated T_{eff} of nine exoplanet host stars, based on literature photometry and spectral templates.
- Generally good agreement ($< 2 \sigma$) with literature values for T_{eff} values.
- Generally good agreement ($< 2 \sigma$) with literature values for radii (exceptions: *Upsilon And* & *Tau Boo*).
- As function of $(V-K)_0$, we do not find any obvious difference in radii or T_{eff} between exoplanet host stars and control group stars.